

CQ-DATV

dotMOBI



Issue 85 - July 2020

<https://cq-datv.mobi>

ISSN 2059-2191

In this issue

<i>Editorial.....</i>	<i>2</i>
<i>News & World Roundup.....</i>	<i>4</i>
<i>Measuring ATV Receiver Sensitivity & Received Signal Strength.....</i>	<i>6</i>
<i>Television Is Far Too Hard.....</i>	<i>9</i>
<i>Grass Valley Mixer Conversions - Part 18.....</i>	<i>20</i>
<i>23 cm Parabolic Dish Antenna.....</i>	<i>28</i>
<i>Information.....</i>	<i>32</i>

Cover picture by Ed Joy, K0JOY

*The CQ-DATV editors gratefully acknowledge
all those authors that have contributed
articles for this free magazine.*

Production Team

Ian Pawson G8IQU

Trevor Brown G8CJS

Terry Mowles VK5TM

Jim Andrews KH6HTV

Contributing Authors

Jim Andrews KH6HTV

Jeffrey Borinsky

Trevor Brown G8CJS

Ed Joy K0JOY

Mike Stevens G7GTN

Welcome to issue 85 of our electronic ATV magazine.

Our Facebook group, CQ-DATV, has attracted a lot of requests to join over the last few weeks. We normally look at the applications and verify they have a genuine interest in ATV or video engineering. What has changed is the groups these people are members of, the new requests are coming from people who are members of upwards of 150 other groups. A little unusual but in itself not a problem. Two of the groups in particular represent similar interests, the rest are anything but and a lot are common to all the requests.

We cannot help but speculate that there is an app somewhere which joins these people up in bulk to sites that they have no interest in. We have also had a couple of inappropriate content postings that we have removed. The two things may or may not be connected.

Now if you request to join you will be asked to answer one of three questions, two for the video engineers and one for the radio amateurs. Your written answers will be forwarded, along with your application. It helps the team decide if we should accept or decline your request. Apologies in advance if this is putting new Facebook members off joining our group, but it is important we keep the group focused on the content we would all like to see.

We started with multiple choice questions, but in these days of google they do not work. So it's written answers, but if people have been joined by a non-discriminatory bulk app and CQ-DATV is one of the groups it sends traffic too, then fingers crossed this stops it happening. Other groups may want to follow suit as the same two related groups keep showing up in every one of these strange applications.

In this issue of CQ-DATV Jim Andrews KH6HTV explains how to measure your ATV receiver's sensitivity. The key to a successful measurement is preventing RF leakage from the test signal source getting into your receiver except via the desired RF path. This is particularly important if you are using home constructed test equipment that might radiate RF other than via the output connector

Jeffrey Borinsky thinks television is far too easy. Anyone with a smartphone can shoot footage of high technical quality and send it, live or recorded, anywhere in the world. Jeffrey goes on to explain it was not always that way and looks back on the early days of Television Outside Broadcasts and some of the kit the Broadcast Engineering Conservation Group are restoring. You may have already seen some of the kit in mainstream TV and films. After this I am sure you will be looking out for it in future. Trevor has commented two of the OB trucks in the article, apparently he has worked on them in his previous professional life. The production team have long had their suspicions of how long Trevor has been in Television.

Ed Joy K0JOY has come up with a new 23cm antenna. This is a modification of a 2.4GHz, BBQ grill, parabolic dish antenna normally for on 1.25 GHz (23cm band). They typically sell in the \$60 range from many different vendors. Ed has kept the BBQ grill parabolic reflector intact but modified the dipole feed element to work on 23cms.

Trevor and Mike have written another column on the GVG mixer conversion and this one explains the history behind as to why they started the project and then goes on to investigating implementing control of the faders and mixer pots in Vmix. Even if you don't have a GVG panel there is a simple programme in Annex BASIC that will let you test the I2C interface using just the ESP and Arduino micros. If you are spinning your wheels looking for panel this might be something to get working in the meantime.

One from the Vault is where we look back at some of the projects that were featured in early editions of CQ-DATV but due to the extended Grass Valley article and not wanting to split the article from Jeffrey Borinsky into two parts, we have made an editorial decision to omit it from this edition.

On behalf of the locked down CQ-DATV production team, sit back and enjoy this issue of CQ-DATV and remember electronic magazines are 100% free of Covid 19.

Facebook

Trevor and I have had several conversations about Facebook. As you can see from the above, Trevor is a keen fan whereas I am not. I find it both sad and worrying that so many people get their news from unregulated sites like Facebook, hence you get people setting fire to 5G cell towers because some idiot on Facebook says that 5G waves caused covid 19.

I will never join as I prefer not to have mine and my friends personal details hoovered up and sold by the Zuckerberg money making machine. However, you may disagree, it is a matter of personal choice, but don't say that you have not been warned! IP.

Refs.

Criticism of Facebook <https://tinyurl.com/ctmvnhp>
F.T.C. Documents Show Extent of Rage Over Facebook Complaints <https://tinyurl.com/ygy6t32b>

Please note: articles in this magazine are provided with absolutely no warranty whatsoever; neither the contributors nor CQ-DATV accept any responsibility or liability for loss or damage resulting from readers choosing to apply this content to theirs or others computers and equipment.



MiniTiouner-Express

Digital Amateur Television DVB-S/S2 Receiver / Analyzer

Available at DATV-Express.com

- Operates with Windows PC using free MiniTioune software from Jean-Pierre F6DZP
- Smaller than a stack of 2 decks of cards (picture above is full size)
- Two independent simultaneous RF inputs with internal preamps
- High sensitivity -100dBm @1288MHz – at 1/2 FEC
- Fully assembled/tested in aluminum enclosure
- Covers 144-2420MHz (ideal for Space Station DATV reception)
- Symbol rates from 75 KSymb/s to >20 MSymbols/sec
- Uses external 8-24VDC supply or +5V from USB-3 port (with small modification)
- Real time signal modulation constellation & dBm signal strength display
- Price: US \$75 + shipping – order with PayPal

For details & ordering go to www.DATV-Express.com



(MiniTioune display above is the ATCO 1268MHz DVB-S repeater signal at WA8RMC QTH 15 miles away).

EM Field Exposure



On the 21 February 2020 Ofcom launched a Consultation on EM Field exposure —Proposed Measures to Require Compliance with International Guidelines for Limiting Exposure to Electromagnetic Fields. Our own response below was submitted on 5 June, ahead of the Ofcom 12 June deadline.

In summary, the RSGB appreciates the need for the ICNIRP guidelines but cannot support the proposals from Ofcom that are onerous. It is felt that the proposals could result in double regulation and are not proportionate to the risk.

Instead, the RSGB recommends a more appropriate change to the existing amateur licence conditions referencing the 2020 ICNIRP Guidelines. The RSGB will also prepare its own guidance and training to help amateurs follow these ICNIRP guidelines.

Ofcom EMF-Consultation: RSGB Response
<https://tinyurl.com/y8d3djdr> (16-page PDF, 5-Jun-2020)

Source: <https://tinyurl.com/yastv6h7>

Radio contest day: Old Mode and IARU Reg. 1 ATV

Giorgio de Luca IU3IOU reports.

Today was a day spent in the mountains for two radio contests: it is the Old Mode 10-24 GHz 2020 Contest and the IARU Reg. 1 ATV Contest. This morning we went up to Monte Tomba - Malga Doch , locator JN55WV io (Giorgio IU3IOU), Davide IU3CLX and Mario I3EME.



Together we worked to prepare the station paying particular attention to the ATV Contest in the 23 cm TX / RX band. After the installation, we dedicated ourselves to the participation of the 10-24 GHz 2020 Old Mode Contest and we started moving to carry out connection tests with 24 GHz equipment with 4 mW and 5 mW gunn diodes and horn antennas with gain of 30 db. The tests led us to create valid radio links for the Old Mode Contest between the three operators IU3IOU, IU3CLX and IQ3QR / P, activated by I3EME while returning home , covering a distance of about 8 km.

I (Giorgio IU3IOU) and Davide IU3CLX remained, we refreshed ourselves with some sandwiches and after lunch we dedicated ourselves to the second contest of the day dedicated to ATV, using the name IQ3QR. Initially we were not very optimistic being the first time in transmission in ATV and mostly in an international contest.



The first connection we could not log because we received the correspondent's signal but he did not receive ours, and this did not help the spirits. But over time and sharpening the weapons a bit, the connections have improved, giving us the opportunity to experience the transmission in ATV, the difficulties of the 23 cm band, the need for precision in pointing the antennas.

A beautiful day dedicated to radio and experimentation.

73 de Giorgio IU3IOU

(Google translation from Italian)

Source: <https://tinyurl.com/y82xakcc>



ATV Italia (Amateur Television)

From Claudio Marega

The way to do contests!

Source: <https://tinyurl.com/yce2xktj>

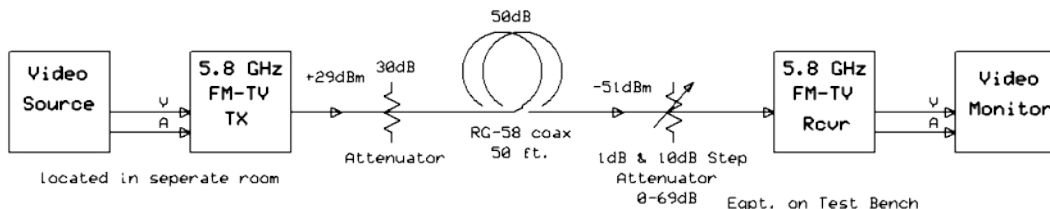
Measuring ATV Receiver Sensitivity & Received Signal Strength

Written by Jim Andrews, KH6HTV

Reprinted from Boulder Amateur Television Club TV Repeater's REPEATER June, 2020

How to measure your ATV receiver's sensitivity? The key to a successful measurement is preventing rf leakage from the test signal source getting into your receiver, except via the desired rf path. RF Signal Generators from companies such as HP, Agilent, Rhode & Swartz, etc. are extremely well designed with multiple layers of rf shielding to prevent any radiation leaking out from the box, except via the rf output connector. With such an rf generator, it is ok for it to be sitting on the same test bench as the receiver to be tested. For our ATV gear, we don't have such suitable TV test signal generators.

We instead will be using our own ATV transmitters, or exciters as our test signal source. Our ATV transmitters do not have the same level of rf shielding in them that is found in professional test equipment.



The above block diagram is how I do it. For my example, I am measuring the sensitivity of a 5.8 GHz, FM-TV receiver and it's associated video monitor. I physically remove my ATV test signal generator from my ham shack. I place it in another room and then run a long coax cable from there back to my test bench. I am thus relying upon the radiation path loss to severely attenuate any rf leakage from my signal source.



5.8GHz, FM-TV Receiver & Transmitter

For accurate measurements of sensitivity, one needs to calibrate all of the components in the rf signal path. I first measured the rf output of the TS832 transmitter using my HP-432A RF Power Meter. It put out +28.8dBm. I then measured the loss in the 50 ft. run of RG-58/U, SMA, coax cable. I used my Wiltron 5447A, 10MHz - 20GHz scalar network analyzer. At the operating frequency of 5.685 GHz, the loss was -49.7 dB. I put a high quality, DC-18GHz, SMA, 30dB attenuator on the output of the transmitter.

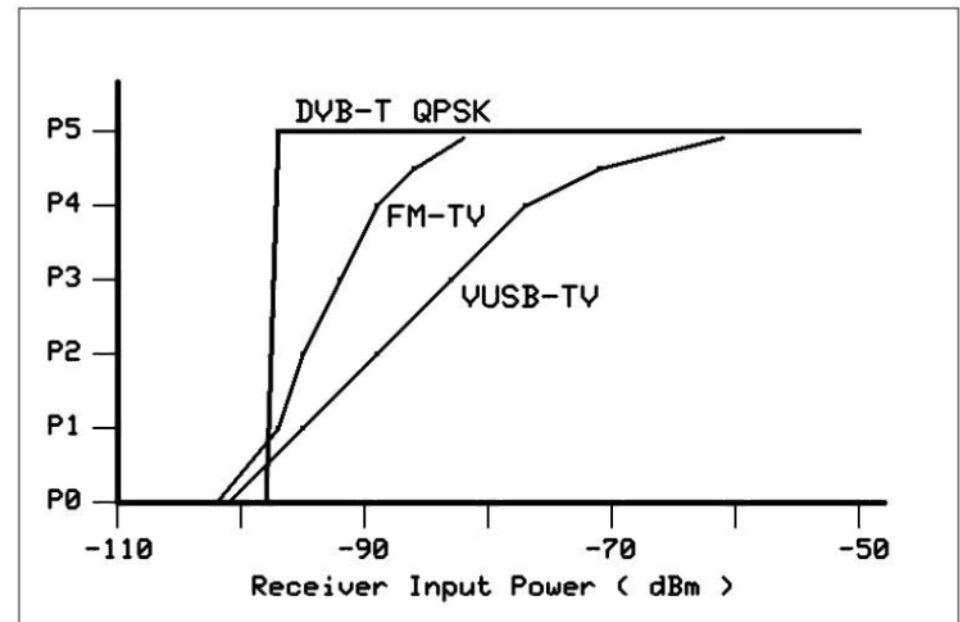
Thus the signal arriving at my test bench at the end of the 50 ft. cable was about -51dBm. To adjust the rf signal level into the RC832 receiver under test, I used a Weinschel, DC-18GHz, SMA, rotary step attenuator. It has 1dB and 10dB steps for a total attenuation of 0 to 69dB.



SMA fixed & rotary, step attenuators

I have used this same basic setup to measure ATV receivers on the 70cm, 23cm, 13cm, and 5cm bands. I have used it for VUSB-TV, FM-TV and DVB-T receivers. It is how I arrived at the plot (above right) of picture quality, P units, vs. RF input power. Note: for VUSB-TV, do not use a conventional power meter. You need to measure the peak-envelope-power.

DTV vs Analog TV



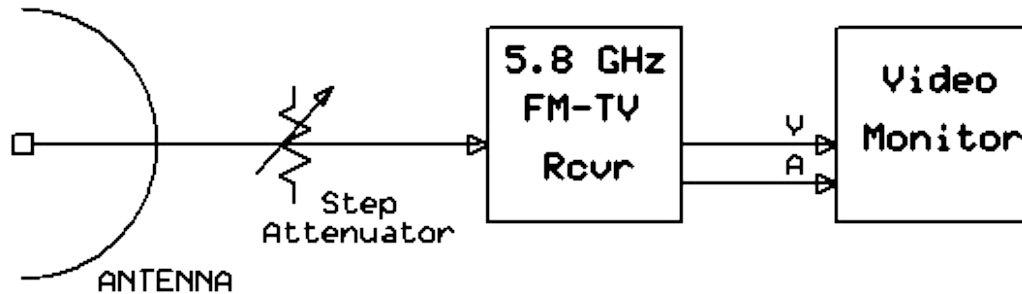
This can be done best with a spectrum analyzer. For a discussion of P units, see AN-5a, "P5 - TV Signal Quality Reporting" at <https://tinyurl.com/ybr4j85m>

So, what were the results for the RS-832 receiver? It was quite sensitive, coming in at about -101dBm for a P1 picture. It actually depended somewhat also on which video monitor I used with it. I tested it with two older, CRT TVs and three, newer, small, flat screen monitors. Two of the flat screen monitors had built-in, blue screen, video squelches. These were the results:

1. Toshiba 14", CRT TV receiver/monitor (last of the breed): P1 = -101dBm, P2 (color threshold) = -99dBm
2. JVC, 5", CRT, color studio monitor: P1 = -101dBm, P3+ (color threshold) = -92dBm
3. Unknown brand, 7" flat screen monitor, 12Vdc, no blue screen, video squelch: P1 = -101dBm, P3 (color threshold) = -93dBm

4. Haier, 7" flat screen TV receiver / monitor, 12Vdc, includes internal battery & video squelch: Video Squelch turn-on threshold = P2 (color) = -100dBm

5. Unknown brand, 7" 1080P monitor with HDMI, composite, & VGA inputs, 12Vdc, plus video squelch: Video Squelch turn-on threshold = P1/P2 (color) = -100dBm



The measured receiver sensitivity results can then be used for in the field measurements of received signal strength.

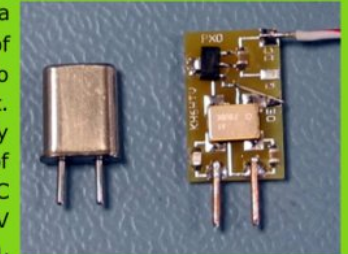
Simply insert your step attenuator between the antenna and the receive input. It is especially easy, and more accurate, if you use a video monitor with a calibrated, built-in video squelch. Simply crank in attenuation until you reach the video squelch threshold. For example, the threshold of the two monitors tested above was -100dBm.

If as with Don's (N0YE) field test reported earlier, he found he had a 36dB margin, then his received signal strength was $-100\text{dBm} + 36\text{dB} = -64\text{dBm}$.



Model PXO-xxx PROGRAMMABLE XTAL OSCILLATOR

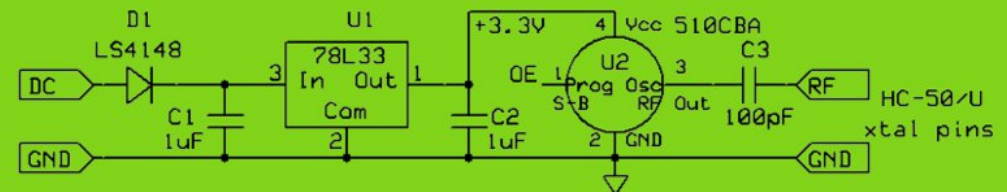
The **NEW** KH6HTV VIDEO Model PXO-xxx is a Programmable Crystal Oscillator. With the demise of International Crystal, it has become very difficult for radio amateurs to obtain replacement crystals for older equipment. To assist in solving this problem, we are offering to supply HC-50/U type oscillators which can often be used in place of the original crystal. We will stock oscillators for the PC Electronics, 70cm, AM-TV transmitters for standard TV frequencies (www.hamtv.com) The price is \$20 each, including 1st class postage. The price for any other frequencies is \$30 each. When ordering, please specify: desired oscillator frequency. The frequency is programmed by the factory. It can not be reprogrammed by the user.



The PXO is a CMOS oscillator running from 3.3V. It includes an on board 3.3Vdc regulator. One of the "xtal" pins, labeled Gnd, goes to ground. The other "xtal" pin, labeled RF, is the ac coupled RF output. Solder a wire to the pad labeled DC. This wire must be attached to a dc power source of +6 to +15Vdc. In the PCE transmitter, the two channel crystal relay provides the ground circuit, thus disabling the power to the unused PXO. For additional details, see Application Note, AN-56a.

Stock Oscillators are available for the following frequencies for use in PC Electronics, 70cm, TV Transmitters. Note: the PCE transmitter output is a 4 X multiplier of the crystal or PXO frequency.

PXO Frequency	70cm Frequency	TV Channel
105.5125 MHz	421.250 MHz	57
106.5625 MHz	426.250 MHz	
106.8125 MHz	427.250 MHz	58
108.3125 MHz	433.250 MHz	59
108.5000 MHz	434.000 MHz	
109.8125 MHz	439.250 MHz	60



PXO-XXX specs. revision 1.0, 4 May 2020

KH6HTV-VIDEO www.kh6htv.com e-mail: kh6htv@arri.net
Boulder, Colorado, USA



**Written by Jeffrey Borinsky, Honorary Treasurer,
Broadcast Engineering Conservation Group**

Television is far too easy now. Anyone with a smartphone can shoot footage of high technical quality and send it, live or recorded, anywhere in the world. But it wasn't always so. It was hard for the professionals so how was it even possible for amateurs? The great pioneers of a generation now almost gone, Mike Cox, John Ware, Grant Dixon to name but three, managed to get hold of kit and improvise. Amateur TV in the UK was formally established by these pioneers in 1949. Just four years later the professionals showed why television would become so vital.

So let's wind the clock back almost 70 years.

In The Sight of All The People

Then the Queen arising out of her Chair, supported as before, the Sword of State being carried before her, shall go to the Altar, and make her solemn Oath in the sight of all the people to observe the premisses.

On 2 June 1953 Queen Elizabeth II was crowned. Thanks to the largest ever outside broadcast (OB) in the UK, 75% of people in the UK saw her coronation live on TV; more than had ever seen a British monarch being crowned before. The Queen's coronation marked British television's coming of age.

Against the wishes of her advisers, the young monarch herself insisted on having cameras in Westminster Abbey. What's less well known is that the very first British OB had been at the coronation of her father, George VI. This was in 1937, not long after the start of the world's first regular high definition TV service, at a time when high definition meant 405 lines. Just three cameras and a single OB truck near Hyde Park Corner allowed viewers a glimpse of the royal procession.

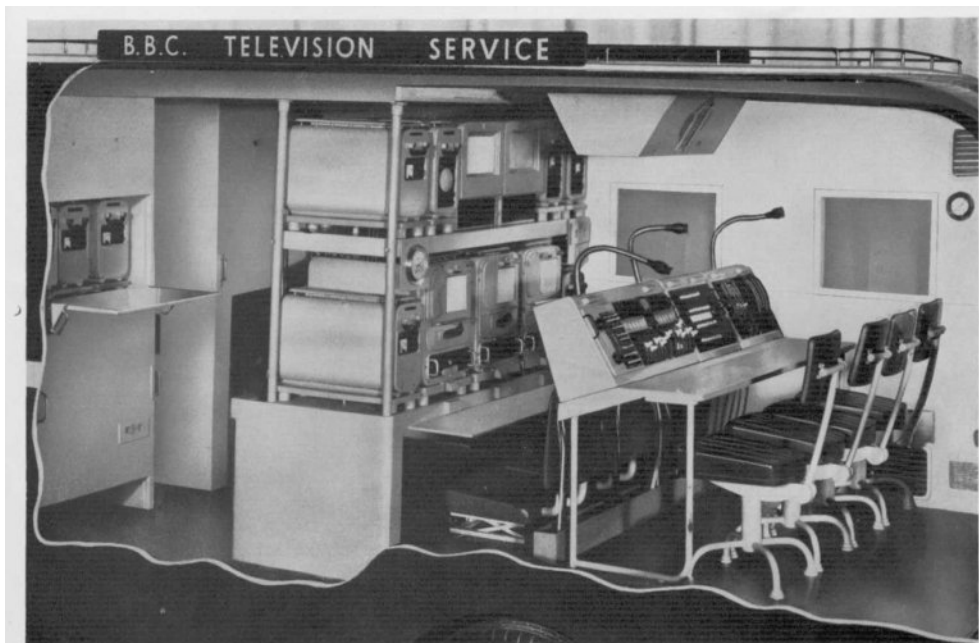
Vivat Regina!

At the 1953 coronation, Hubert Parry's 1902 setting of the coronation anthem I was glad was sung by the Westminster School choristers, complete with the cry: Vivat Regina! It was therefore only fitting that the project to re-create a coronation-era OB truck should be called Vivat.



Vivat in London

There are no surviving examples of 1950s BBC television outside broadcast units, despite the '50s being such an important decade for the new medium of TV. Project Vivat has remedied that by re-creating a representative operational unit.



Sectional view of a model of a current design for the B.B.C., the vehicle itself being depicted below



**Marconi 1950s
publicity images**



Vivat as found

It is based on a very similar early 1960s vehicle, fitted out with original early 1950s equipment. The vehicle is 390 EXH, originally the BBC's MCR23 (Mobile Control Room).

Before it reached us, Vivat was languishing as a redundant and derelict mobile classroom.

After much work by BECG members, paid for by them personally, it now looks splendid in the original dark-green BBC livery. Most of the monitors and other equipment have now been installed.



Vivat restored interior



Vivat on set for "The Crown" with Paul Marshall playing a cameraman



Vivat in BBC service as MCR23

The cameras and associated equipment are Marconi Mk II and Mk III series, the models used at the coronation. Final wiring remains to be done. The BECG would like to thank Bryant Unlimited which has sponsored the project with donations of cable and connectors.

Vivat has been used as a prop in several productions, most notably for a scene at Churchill's funeral in The Crown. Paul Marshall is a very good vintage cameraman!

Yorkshire / Tyne Tees NUB 327F

ITV used to be a collection of regional companies that were friendly rivals, each with its own identity and traditions. So why the curious split personality? This truck was built for the newly formed Yorkshire TV in 1968.



Yorkshire/Tyne Tees as found at Harefield

After various adventures it is now in the BECG, but with Tyne Tees colours. How did that happen?

Built by Marconi on a Bedford chassis, it was one of the "Yorkshire Twins" that opened the service in 1968 (literally, as the studios were not finished!). Later it was sold to the Central Electricity Generating Board (CEGB) as a production vehicle for training videos, and then acquired by Harefield Hospital Television, where we first set eyes on it. Fast forward twenty years to 2001 and it was decaying so we agreed to purchase it and preserve it.

We collected it in January 2001. It still had lots of equipment fitted, both original and additional. It was covered in moss and hadn't been started for ten years, but a pressure washer, some new hoses, fluids, diesel, batteries and a large "battery boiler" coaxed it back to life and we drove away. A split coolant hose was the only incident on the way back to base.



Yorkshire/Tyne Tees in original Yorkshire livery

After a good clean out we started to refit and repair. We fitted a mixture of cameras and control gear to make a sort of chameleon rather than a strict preservation.

Things were pushed along by a request for the truck to appear in the 2003 Christmas special of The Royal filmed in Scarborough, which was Tyne Tees country. A quick paint job and some decals supplied by the production company transformed the old Yorkshire truck into Tyne Tees TV OB unit 3 and that is how it has stayed ever since. It has subsequently had a new high-quality respray.

Out and About

Many CQ-DATV readers will be familiar with this truck.



Yorkshire/Tyne Tees in fake snow for The Royal

Amongst many outings it has been to a Marconi reunion in Chelmsford where it received a very warm welcome. Pictures from the truck went out live on Anglia TV news.

In 2006, there was a special event at Alexandra Palace in North London to celebrate the 70th anniversary of the start of the BBC television service. We used the truck to make a programme using vintage technology – two Marconi Mk IV cameras and one Marconi Mk V camera cabled back to the truck, which was parked on the terrace outside the studios.

We had several working 405-line sets supplied by enthusiasts to display the programme live in the old transmitter hall and it was also carried by a local amateur television repeater.



Yorkshire/Tyne Tees on the terrace at Alexandra Palace

Equipment

Besides having a dual personality, several types of equipment are fitted so it can be used as a technology exhibition. Monochrome cameras are Marconi Mk IV and Mk V using 4.5" image orthicon tubes. Colour cameras are Marconi Mk VIII Plumbicon.

Inside and Out – The OB Story

While many early TV performances came from the studios at Alexandra Palace, there were also exciting events elsewhere.

After that first OB in 1937, the BBC covered numerous events outside the studio.



The football authorities worried that TV would reduce their crowds at matches, but tennis and boxing had no such qualms; Wimbledon was a regular OB fixture. The BBC used all its limited OB resources for the 1948 “austerity” Olympics. And some OBs literally worked “in the field” as this photo from 1954 shows. The camera is a Marconi Mk II image orthicon; a Pye D16T receiver is being used as a monitor.

Television History – Live!

It's Friday 15th November 2019 at Birmingham City University and Southern TV is live on ITV News. The occasion was the 50th anniversary of colour on BBC1 and ITV, and this was no fantasy. A 1968 vintage outside broadcast truck and cameras were live on air for the first time in over 25 years. Martin was camera operator, Richard vision mixing and Paul on racks. Phil, Dave and I had fingers firmly crossed, hoping that nothing would go wrong.

The six of us are the founding trustees of the Broadcast Engineering Conversation Group (BECG), a newly formed

charity dedicated to restoring TV's past for the future. The event celebrating the 50th anniversary was organised by Kaleidoscope, an organisation that preserves historic TV programmes. We were invited to take part because we own preserved historic TV equipment in working order. This is part of our mission to present television history to the public. The ITV reports from the event are on Youtube:

<https://youtu.be/9o-3L3qbypo>

<https://youtu.be/U4QSnVo2reI>



Above and next page: Southern and Marconi Mk VII camera with ITV satellite news truck



Part of a display of vintage cameras and TVs at Birmingham City University

For many years, amateur TV enthusiasts used all kinds of old broadcast cameras and other equipment, simply because it was all they could afford. Gradually this equipment went from necessity to interesting vintage.

A few people have specialised in this sort of vintage kit, and six of us have formed the BECG.

Our large collection of equipment includes several outside broadcast trucks.

***This is your free ATV magazine.
Please consider contributing an article!***

Southern Television OOW 999G



Southern with cameras

As with Yorkshire/Tyne Tees, many CQ-DATV subscribers will have seen Big Bertha, as she's affectionately known, at events. We rescued her from Meridian TV's car park in 1995. At that time the truck was just a shell with few original fitments and was painted in TVS silver. After a five-year programme of repair and refitting, she made her debut at the Newark Vehicle show in 2000 and was featured in *Bus and Coach* magazine.

Southern TV bought OOW 999G in 1968 as a bare chassis Bedford VAL 70. The outer coachwork is all fibreglass; this was a requirement as a lot of work would be done next to the sea. The electronics fit was done in-house by Southern TV engineers with help from the Marconi Company.



Southern interior

This gives the unit a uniquely home-made feel in comparison to others in their fleet.

Originally fitted out with monochrome cameras, she was quickly converted to colour operation using four Marconi Mk VII cameras and was used at the Investiture of Prince Charles at Caernarfon Castle in 1969, as was every other colour OB truck at the time.

When Southern TV lost its franchise in the 1982 ITV re-organisation, the truck passed to TVS which continued to use the truck throughout its reign, refitting it several times. After the ITV franchise changed again, this time from TVS to Meridian, the truck was abandoned in a car park at Northam Studios.

After a little loving care, and some new diesel, lubricants and coolant, we drove it away to start its new life in preservation.

In Preservation

Southern has been shown in public many times. Before it went live on air in Birmingham, other events included 10 years at the Lincoln Steam and Vintage Show, several BATC conventions and an appearance at the Sandtoft Trolleybus Museum. In 2008 we drove Big Bertha all the way back to Southampton and parked her outside the Rose Bowl for the celebration of 50 years of ITV in the south.

Equipment

We have tried to restore her to the original colour fit-out using equipment of the original type where possible. Some original fitments have survived, including power, some woodwork, air conditioning, racks and audio patching. The colour cameras can be up to four Marconi Mk VII. Monochrome monitors are Pye. The Barco colour monitors are not 100% authentic but are much more reliable than the originals. Most of the other equipment is by Marconi.

ABC-Thames GNF 951E

Our latest acquisition has a long and interesting history, taking it from ABC to Thames to Sony. It finally became a mobile home before we acquired it.

History

After the Football World Cup was awarded to the UK in 1966, ABC Television ordered three new Outside Broadcast trucks. These trucks were state of the art, incorporating a number of firsts:

- All-transistor equipment
- Longitudinal layout (the operators face sideways, not forwards)
- Separate operational compartments for sound, production and engineering.



ABC-Thames as found

The trucks were built on Bedford VAL-14 chassis, fitted out by Marconi and supplied to operate with up to six Marconi Mk V image orthicon monochrome cameras.

Following the ITV franchise changes in 1968, these trucks were transferred to Thames Television which kept GNF951E and converted it to colour, using Marconi Mk VII cameras. The unit remained in service for over 10 years before being sold to Sony, which used it as an HDTV (High Definition in the modern sense of 1000+ lines) demonstration unit. During this period the truck spent some time in Italy making pioneering HD programmes.

A new owner in 1992 used it for several purposes including as a mobile home, an art gallery and a costume store.



ABC-Thames in service with Thames TV

BECG acquired the unit in 2018, with a view to restoring it as an outside broadcast unit. The vehicle is in good running order and the bodywork has little rust.

Apart from the air conditioners and some 19" rackmounts, very few original fitments survive. We plan to equip the truck with Marconi Mk V image orthicon and Marconi Mk VII Plumbicon cameras, giving the unit both monochrome and colour capability.

So far, we have stripped out the mobile-home interior. Further restoration will have to wait for money and effort to become available.



**Left: Jeffrey working on stripping out ABC-Thames
Right: ABC-Thames interior as found**



Left: Paul and Dave: We've found this false floor. What do we do now?

Right: Martin has the answer! Use the angle grinder.

We are a small association of qualified, experienced and motivated professionals dedicated to the survival and interpretation of television history. We have come together to put elements that individuals have collected into the BECG. Whilst we are currently privately funded, this has not been a bar to achieving many successes in this field. We are now a registered charity.

We have many cameras, monitors, video tape recorders and all the less visible paraphernalia that are needed to make TV programmes. The biggest and most visible parts of our equipment are four outside broadcast trucks; they are the main feature of this article.

Promoting and demonstrating vintage television is the main purpose of the group.

This article was written by Jeffrey Borinsky, Treasurer and founding trustee of the BECG. Much of the information was contributed by fellow founding trustees:

- *Dr Paul Marshall (Chairman)*
- *Dave Hill (Secretary & Webmaster)*
- *Martin Pritchard*
- *Richard Harris*
- *Phil Nott*

Credits

Editorial assistance: Ruth Slavid: ruthslavid@gmail.com
Photos: BECG members and Ruth Slavid

The BECG is a registered Charitable Incorporated Organisation (CIO), number 1189469.

The BECG is financed entirely by the founders and by private

donations. If you would like to learn more about us, or help us in any way please email at: contactus@becg.org.uk

More information on the trucks, their equipment and other BECG activities can be found at: www.becg.tv

Much of the equipment shown in this article is available to hire for film and TV production.

**So I bought a new transceiver
and she asked...**



**“Are you going to sell any of
your old ones?”**

Grass Valley Mixer Conversions - Part 18

Written by Trevor Brown G8CJS and Mike Stevens G7GTN



Every now and again the odd email floods in with questions, along with questions asked on social media. It is interesting to see that this project has sparked off some interest. As far as I know the only GVG 100 panel equipped with the CQ-DATV 68 hardware interface and running GVG 15 software is on my desk.

There is a counter on the software download site that records when every project support programme is downloaded and, at the time of writing, the GVG 15 package has been downloaded 25 times. Does that mean that there are 25 of these panels that have been or are being adapted? Well I am sure that is not the case!

The downloads must include the curious that just want to look at the code, the people that collect these things with the intention of getting around to securing a panel and adapting it at some time in the future, but then maybe, just maybe, one or two others that have started and may even have finished and have a working panel, but prefer keeping information of their progress to themselves.

I am sure if we could source some panels and adapt them or even market the PCB, preferably populated with its connectors and a wall wart power supply, there would be more. CQ-DATV is a platform for discussion and help for those that want to develop and build their own projects, not an Amazon for ready to switch on kits.

Why did I start the project? You might well ask.

Several years ago another ham, Peter Blakebrough G3PYB, (who sadly is no longer with us) cobbled some kit together and started recording and live streaming various ATV and associated lectures on the internet. The technology was here, and this was an excellent use of it.

The first lectures were streamed from a Microwave Round Table meeting followed by the AMSAT colloquiums. His production switching kit was home constructed on Veroboard and he used two professional TV cameras that were old and insensitive and past their best, but would genlock together so that the simple Veroboard switcher could cut and mix between them.

There were problems and the genlock packed up during one of his transmissions leaving only the backup recordings. These suffered from the non-sync cuts, which resulted in plops, black holes, and loss of lip sync on the recording at every cut. Peter carried on recording and sent me the tapes to see if anything could be salvaged for the download site.

This was long slow tedious work, most of it through the night. During the process I received frequent phone calls asking for progress reports. The bad cuts were edited out, the sound was moved to restore lip sync and the holes filled by stretching some of the material. It was a rescue mission not an edit.

One by one I got the programmes in a watchable format to the download site. This streaming of lectures was a new world and one that helped bring the amateur community together. The live streaming had more appeal than the downloads, particularly when another ham, Chris Smith G1FEF the father of the streaming and download site, added two-way text. You could not only watch, but questions could be asked by the viewers and answered as a live Q&A session at the end of the lectures.

What Peter had started had legs, just needed better kit. Genlock was necessary to synchronise the cameras on Peters original Veroboard mixer, its old technology and locks you into dated insensitive cameras. The modern approach is field synchronisers EG a memory store that can delay one source to bring it into synchronisation with another. The technology is built into modern mixers and was the way forward.

The first one we used was the Datavideo SE500. This was a four input PAL mixer, with the four inputs displayed as a quad split on a single monitor. It was the bottom end of the synchronising mixers, but with a couple of LCD screens you see the cameras and make production decisions and see what you were transmitting without humping colour monitors along. It opened the door to multi-camera recordings and live streaming with non-genlock cameras.



THE DATAVIDEO SE 500 synchronising mixer

The modern cameras in turn opened the door to wide screen, they were sensitive, reliable, and most of all lightweight.

These events were still a cable rigging nightmare and the solution was to build the kit into a pre-wired case along with the LCD monitors, caption generators and a third device that could bring any overhead projector up as a video source (ok until laser pointers arrived).

By a case I mean a 14U rack box that would not quite fit in the average car boot! This was only going to be a stopgap measure while something better could be sorted. It was all in PAL and nevertheless covered itself in glory for its first outing which was the E.M.E. meeting in Cambridge.

The ultimate solution would be something that was digital not PAL, retained the picture in picture view of the camera's, made its own back recording, did not require a 14U case and was affordable so other groups could take up the challenge of live streaming.

The recording direct to disc was a must, so any editing for the download and archive site would not involve digitising the tapes. A computer was necessary for the streaming and if it could also double as a recorder so much the better. My ideal model was always to be able to sit in front of the GVG panel and mix the cameras, add the straplines with camera ops that could contribute by having cue lights and communications.

As I said in the last issue, I had used a GVG 100 mixer on air for an ITV transmission of a Music Box TV show with 6 million viewers. No, I did not take the kit with me when I left ITV, but with the passage of time they are now very affordable on the surplus market. Just that the performance of the rack mounted crate is dated as it does not synchronise, but the panel is still brilliant and has fond memories for a lot of people who have used one professionally. It just needed a connection to a synchronising mixer, or the old crate would lock us into old cameras, large monitors, and a lot of humping for streaming an event.

The Vmix package is a good start. The streaming PC can mix the cameras, play in VT inserts and record the mixer output. Lots of hams use the free version, but it is all point and shoot using a mouse. Commercial control surfaces are available, but like all panels, the cost of professional, back lit buttons and T-bars are not cheap and the price is reflected in the cost of the control surfaces, but to be able to sit behind a professional panel, mix down the cameras and add strap lines, lecture titles and start the built in recorder or even ISO record (record each camera or source separately to help in a future edit) was the ultimate aim.

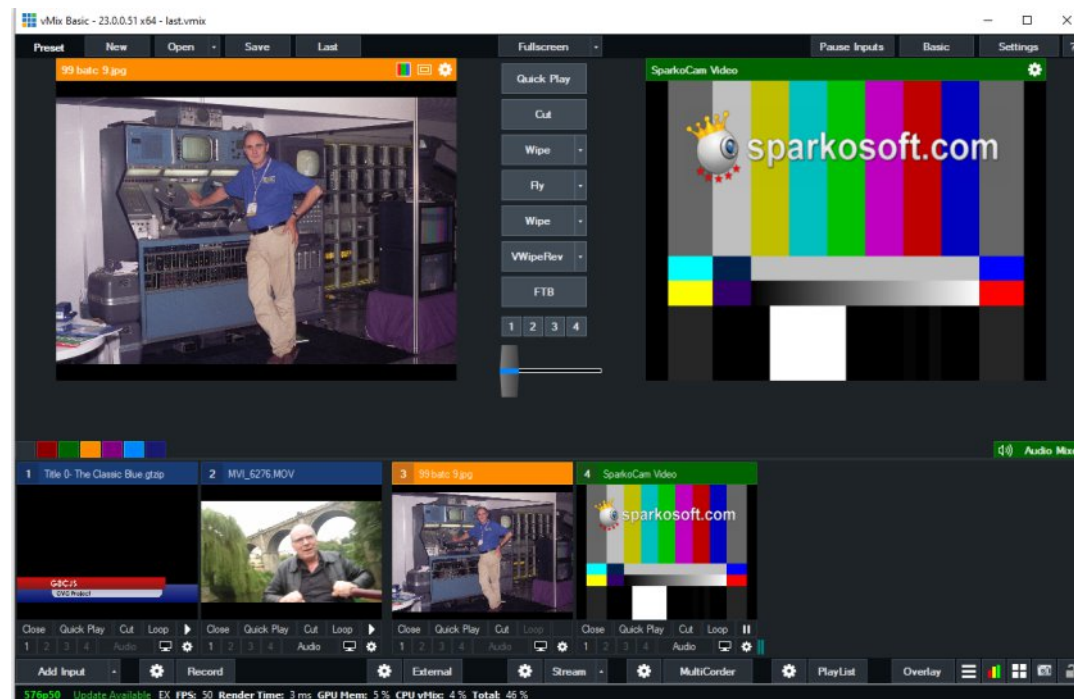
Yes, I had acquired a panel some time back, it sat in my loft and looking into how it works was always on my to-do list. Perhaps it took too long for me to get around to it, but I have recently been reviewing my "to-do" list, the potential projects in my loft, and my age and mortality, so it's now or never.

The streaming of lectures is in decline and perhaps some better cost effective kit could kick it off, so last year I started and in the words of a famous TV presenter "I have started so I will finish", this was back in CQ-DATV 68 when COVID 19 had never been heard of.

Initially I just explored the GVG panel with a prototyped dongle and some simple BASIC code with an ESP micro. It was a steep learning curve! I am not really a code writer, but as all the motivation speaker say "You can't expect to be at new level with an old mindset". I was a little of a doubting Thomas at first so I never revealed my ultimate destination until the last issue when we had demonstrated the end objective.

It actually worked or at least a large part of it, due to Mikes G7GTN's MIDI interface. There are still bits to tidy up, but it was important to put the project together and get it out there so others could follow in our footsteps. The use of BASIC code for the ESP should enable the uninitiated to start and

follow my work, yes it's an old language, but one that just refuses to go away and keeps reappearing and the Annex version is particularly good and worth giving a try. I have added lots of comments to the published listing so it can be followed and experimented with. Mike being younger and brought up in the modern age wrote the interface in C+. Again we included the full source code listing in the download package. The BASIC runs on the ESP micro and sends I2C commands to the Arduino Pro. The Arduino communicates with Vmix via the computers USB port.



Vmix front Panel

A Vmix box that could connect two or three cameras through HDMI cables, even though they have length limits, might just lead to a simple less time consuming rig that could be up and running in minutes, but with a professional panel at the heart would be a dramatic improvement and something that others might want to emulate. All that is needed is a panel, build the CQ-DATV 68 interface, download the code and give it a try.

Ok I missed off motivation and drive, but that goes without saying. CQ-DATV had the space to spare so we launched this as a warts and all voyage of discovery rather than finishing it and then presenting it as a single completed article. That way we thought we had you hanging on waiting for the next instalment (well probably not). Since the article was started at least three GVG 100 panels have changed hands on eBay and I am sure that is not the only source.

This technology has been called “a TV studio in a box” choices were limited, but more technology is evolving. If you think back a few years a three camera shoot would have required a large custom truck, that in turn needed air-con to keep all the power hungry kit cool, a power connection beyond a domestic supply, a team of support riggers and tweekers also probably a day to get it in place, powered up and working.

Technology is on our side and thankfully there is more than one solution. Newtek have the Tricaster, Black Magic have the ATEM, neither is cheap, although ATEM have now brought out the small ATEM mini which is verging on affordable, but in the cut down from its big brother they have missed out the most important feature Multiview e.g. the built in picture in picture monitors that enable you to see the cameras and make production decisions on which to make the next cut.

Interestingly enough there is an interface for the GVG panel to the ATEM. It was developed by Baz Leffler in Australia and is marketed as ready built unit. GVG panels with this fitted can change hands for around 1000+ GBP (without the ATEM) as opposed to 50 to 100 GBP for the raw panels depending on condition.

Hence the decision to engineer our interface to Vmix which does have a demo level free software package that will allow four video sources to be production switched.

If this sounds too good to be true well Vmix is not the easiest unit to plug cameras into. It is a software package that needs a PC to host it and interface cards to connect in the cameras. My PC is a NUC (smaller than 6 CD cases staked up) it is state of the art with a silicon disc and no noisy fans to keep it cool, so another step towards portability. The downside is it does not accept internal video cards so any interface cards would need to be external although it does have USB 3 ports and an HDMI port.

Plugging the family camcorder into the HDMI port does not produce a result, would it be that it was that easy. My little webcam plugged into the USB port does however deliver a result! It is not really TV production friendly in that it has autofocus, (sometimes that has a mind of its own) no viewfinder and the lens that would not be my choice for TV production work.

Don't give up! There is SparkoCam a software package that's not expensive and has a drop-down menu for Nikon and Canon DSLR cameras, the only Canon camera I have is the S95 and although Vmix will recognise SparkoCam, Sparkocam will not recognise the S95. If you have a Canon or Nikon camera, please download the demo SparkoCam and try it and let the production team at the CQ-DATV editorial office know how you get on .

The other news is that due to COVID 19 (yes there is an upside) and the increased use of the internet for both broadcasters and those of us in isolation under various rules, Canon and maybe others have been investigating connecting their cameras to computers for use as webcams.

There is a list of recent mirrorless DSLR's and Power Shot cameras that will work under windows 10, again we can only report on what we read on the net.



SparkoCam Front Panel

There are also external third-party adapters for you to try such as the Wiistar which again might or might not get you a camera connected to Vmix

EOS DSLR Cameras

EOS-1D X Mark II	EOS Rebel SL2
EOS-1D X Mark III	EOS Rebel SL3
EOS 5D Mark IV	EOS Rebel T6
EOS 5DS	EOS Rebel T6i
EOS 5DS R	EOS Rebel T7
EOS 6D Mark II	EOS Rebel T7i
EOS 7D Mark II	EOS Rebel T100
EOS 77D	
EOS 80D	
EOS 90D	

EOS Mirrorless Cameras

EOS M6 Mark II
EOS M50
EOS M200

EOS R
EOS RP

PowerShot Cameras

PowerShot G5X Mark II
PowerShot G7X Mark III
PowerShot SX70 HS



We promised in the last issue we would look into interfacing the T-Bar and analogue pots. This requires a different type of MIDI message from the Arduino, the one we have used so far for the buttons is "Note On Commands". This has three parts, a channel number a dedicated note number and a velocity.

This last part is not decoded by Vmix and is only of interest if you are interfacing to a musical device.

For an analogue value of any panel pots we need to send a different type of control message called a "Control Change".

As the name implies it is a changing value when the T-BAR is moved.

For Vmix mapping control, this value must range from 0 (no movement) to 255 which shows full travel of the fader although this might need truncating for driving Vmix.

The Pro Micro running this is waiting in a loop that is an interrupt driven routine waiting to receive the value 76 (as in the T-BAR or one of analogue pots). This is only the case for note 76 and was implemented on the software in the GVG 15 download.


```

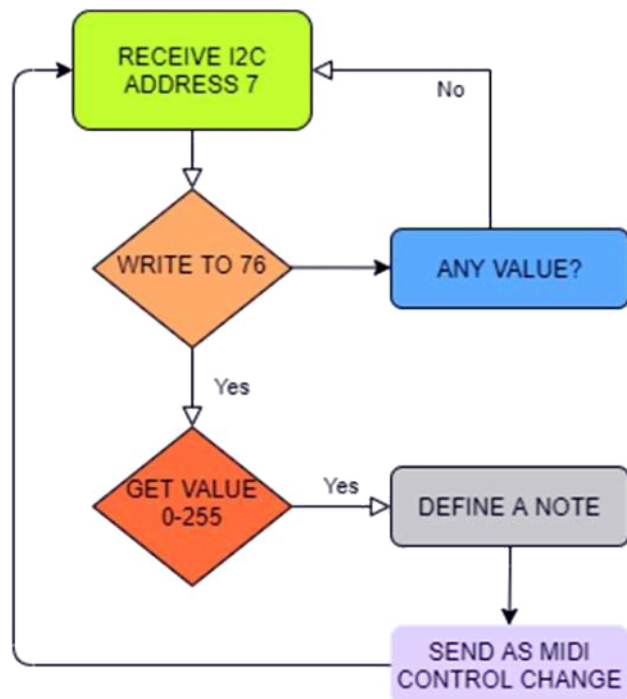
case 76:          // T-BAR FADER
//note76();
while (Wire.available () > 0)  // Still have data?
{
  byte b;
  b = Wire.read();
  #if defined showserial
    Serial.println("RECEIVED NUMBER:");
    Serial.println(b);          // Send value to Serial
  #endif
  controlChange(1, 5, (byte)b); // Set the value of MIDI CC to I2C Value
  MidiUSB.flush();
}
break;

case 77:          // MASK
//note77();
while (Wire.available () > 0)  // Still have data?
{
  byte b;

```

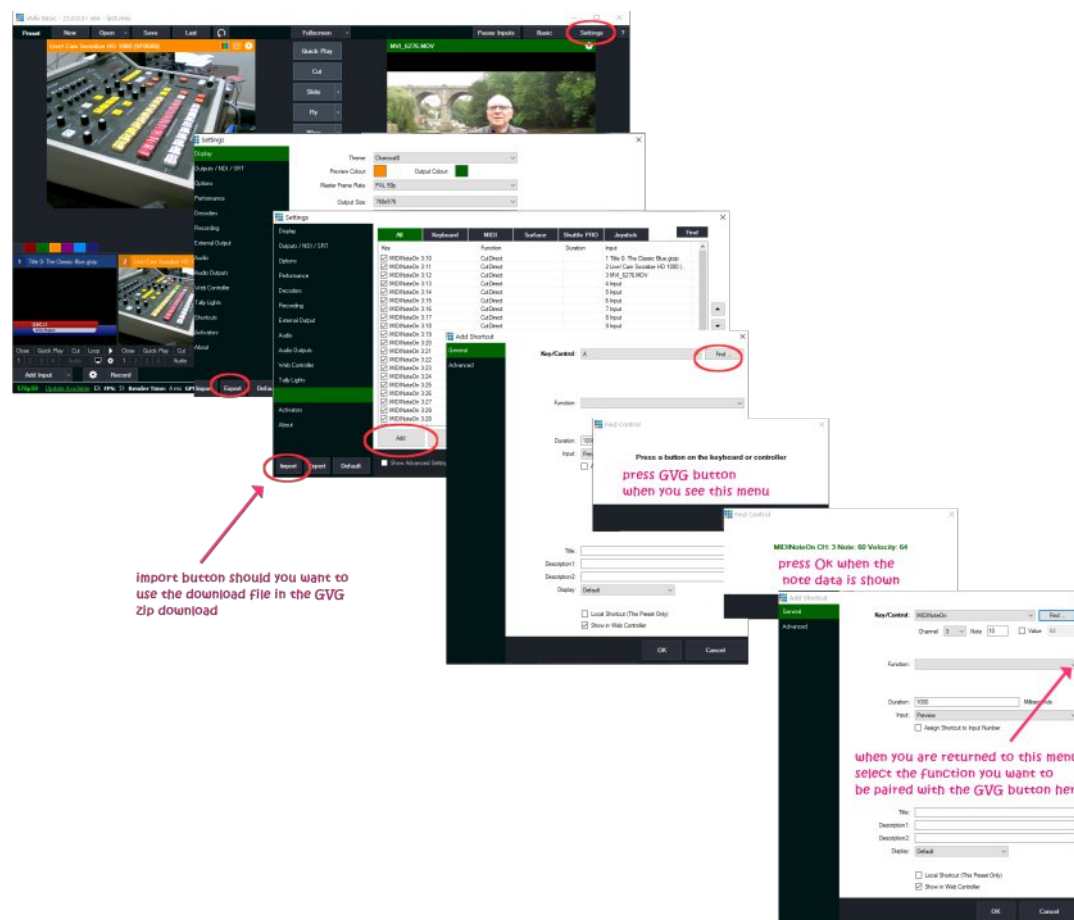
Above: The actual C+ code routine part of the GVG 15 Zip download

Below: MIDI control change function



When the GVG delivers 76 to the Arduino at address 7 it issues a MIDI Control Change to Vmix, which then looks for the next value and interprets it as analogue data.

We keep sending 76 and then the next analogue value as a data sandwich and in this way, we can convey an analogue value one way from our panel to Vmix. We have to tell Vmix what to do with it E.G. function and although we included the routine for the Arduino in the GVG 15 download, we did not include it in the Import set up file for Vmix so you have to add it manually as follows.



Vmix Settings

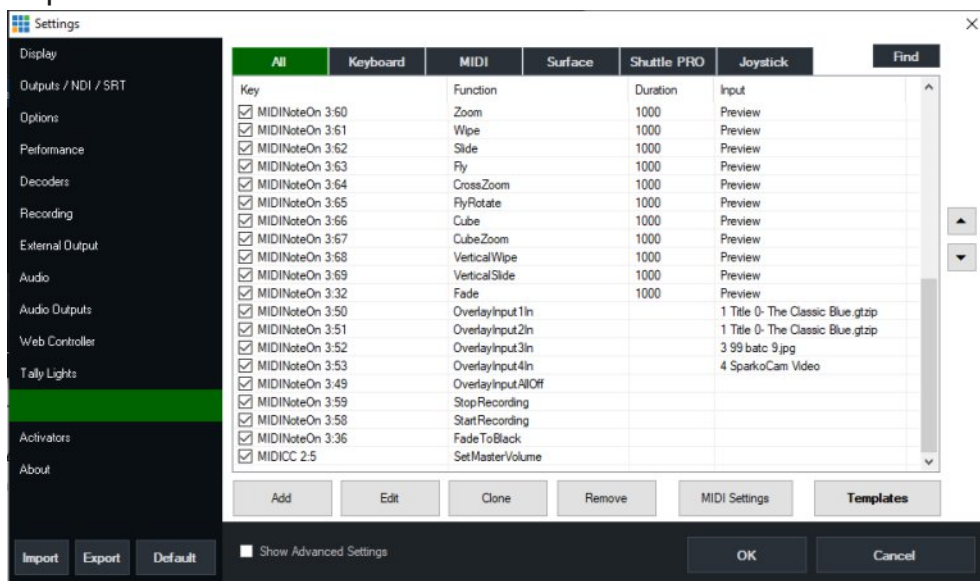
Enter the VMIX Setting menu (top right on the front panel)
Select:- Shortcuts, Add, find (on the add shortcut menu) pop up appears (press a button on the keyboard or controller).

Run the BASIC programme on the ESP (moving Pots) listed below and also on the CQ-DATV download site.

The channel number and note command will be displayed (Velocity keeps incrementing - do not worry, ignore it) press OK you will be returned to the earlier menu and the setting will have been added E.G. Key control MIDIControlChange Chanel 2 note 5.

The function drop down will enable you to browse up an analogue function - try Set Master Volume to start with. Save and exit the setting menu open the Audio Mixer and with the programme running you will see the on-screen Master Audio moving up and down.

If you want to try the front panel cross fader (centre screen on the front panel) in settings select edit, then change the function only to Set Fader and the BASIC programme Moving pots will move that instead.



We only have one analogue channel it's 76 in the Arduino programme that is in the GVG 15 zip download but its enough for you to experiment with all you need is the programme Moving Pots and that is on the download site and also below if cut and paste works from the magazine. There is an example video in the CQ-DATV Facebook site.

```
i2c.setup 4, 5
do
i2c.begin 7
let i=150
wlog "Start"
here:
let i=i-1
gosub fader
wlog "Fader Position",i
  pause 95
if i <> 0 then goto here
there:
let i=i+1
gosub fader
wlog "fader position",i
  pause 95
if i <> 150 then goto there
wlog "Finished"
loop
```

```
fader: ' sub routine
  i2c.begin 7
  i2c.write 76
  i2c.write i
  i2c.end
return
```

Left: Shortcut menu showing MIDICC channel at the bottom set for Master Volume

Ok, we have made a start on analogue and have produced a simple test programme that you can use without a GVG panel. You will need the ESP Micro an Arduino pro micro and the free ANNEX editor.

Have fun and we will investigate adding analogue channels to the GVG BASIC and further analogue channels to the Arduino interface.

This is not the end nor the beginning of the end, you know the rest of the quote, GVG 19 will be in the next issue of CQ-DATV.

Some useful links:

Wiistar Capture Dongle Grabber Recorder on Amazon

<https://tinyurl.com/y72p3poa>

Sparkocam

<https://tinyurl.com/yah6p5dk>

canon cameras dslr eos webcam utility announcement

<https://tinyurl.com/ycgjroge>

<https://www.vmix.com/>

<https://www.vmix.com/help23/>

annex basic getting-started

<https://tinyurl.com/ycdeoywx>

annex basic home page

<https://tinyurl.com/ybckt6pp>



Why our websites have been offline for so long ...

March 6, 2020 from DF3EI

Now it is back: our AGAF homepage. Our server was hacked last fall; the attacker (s) use our resources to send mass mails to users. These complained to their respective providers, which in turn to ours, and as a result our server was shut down to avoid further damage. A similar incident had also shut down the BATC web server shortly before.

Due to various circumstances, it took longer for us to develop a new server concept that avoids that all services (mail, homepage, document management, etc.) stand still should there be new attacks in the future. The reappearance of our website is an indication that this concept is now being put into practice.

Fortunately, our documents and video library were not affected by the attacks; we hope that we can transfer most of the content completely to the new server. We did not restore the user database because there were many attempts to break in. Unfortunately, this means that members have to register again on our website. We ask for your understanding with the reference to data security.

We can hope that you will still have some time until everything runs as we were used to. All of this takes place in our free time and alongside work, family and amateur radio.

If you have any questions or suggestions, or if you would like to help fill these pages with life again, feel free to contact me: df3ei (at) gmx (dot) de.

In this sense, a warm 73 from Vienna,

Jörg, OE1AGF

23 cm Parabolic Dish Antenna

Written by Ed Joy, K0JOY

Reprinted from Boulder Amateur Television Club TV Repeater's REPEATER June, 2020

Ed has struggled for quite awhile getting a solid signal into the ATV repeater. He decided to come up with a new 23cm antenna. Considering Ed's background it was to be expected that Ed would not want to just buy an antenna, but to design his own. The result was a modification of a 2.4 GHz, BBQ grill, parabolic dish antenna for use instead on 1.25 GHz (23cm band). These antennas are rated for 24dBi on 2.4 GHz. They typically sell in the \$60 range from many different vendors. Ed left the BBQ grill parabolic reflector intact. He modified only the dipole feed element to work on 23cms.

Antennas have been Ed's love since teenage years. For many years, Ed was a professor in electrical engineering at Georgia Tech, specializing in antennas. He is now professor emeritus, but he still teaches several times a year short courses on antennas and antenna measurements.

As Ed was working on his modifications of the 2.4 GHz dish, he kept us informed via our ATV nets. Each week, Ed gave us another antenna lecture on the principles of what he was doing.

Each week, Ed created more new power-point slides to illustrate his lectures. Ed has provided me (kh6htv) with a pdf copy of his power-point slides to be used here in our ATV newsletter. There are 42 slides overall.

I am selecting a few of his slides to include here in the newsletter to describe Ed's new antenna. If you would like a pdf copy of Ed's complete slides, Ed is willing to send you a copy. Just shoot me an e-mail, and I will forward it to Ed.



Reflector Antenna Installed on the Rooftop



WELL READ THE WORLD OVER

CQ-DATV

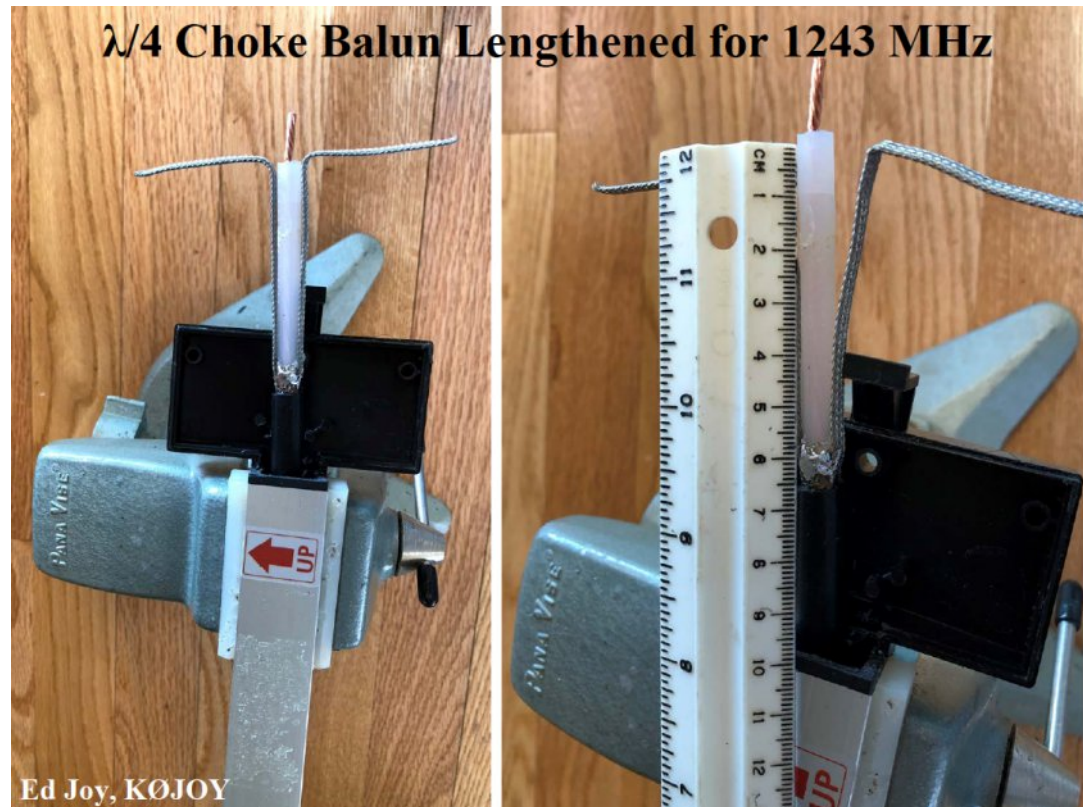


**Original Altelix AG24G24-NF reflector (grid) Antenna.
Dipole and Coax Choke Balun Located in the Black
Plastic Box**



Dipole Feed Reflector Five Vertical Dipoles in U-Shape

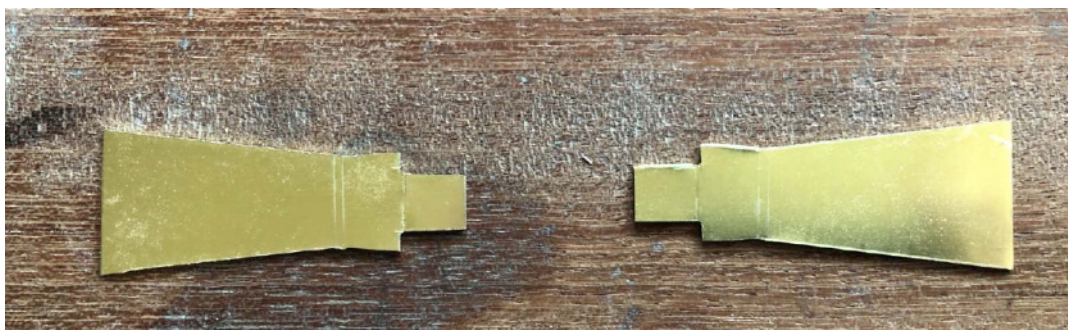
This (left) is the original dipole feed for the BBQ grill antenna, prior to modification. Ed disassembled it to get at the actual dipole element and also the $\lambda / 4$ choke balun. The next photo shows how he modified the choke balun to work on 23cm band.



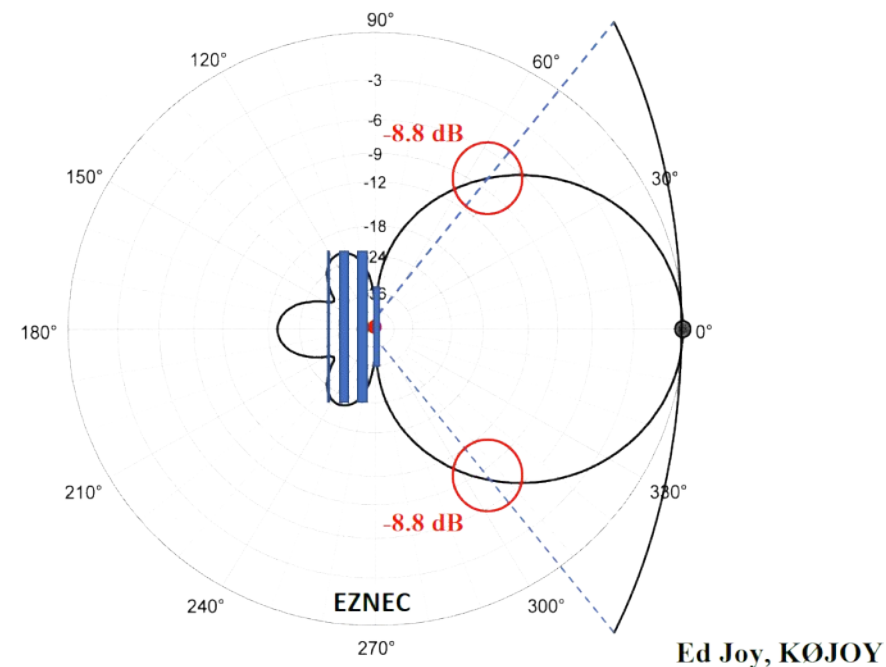
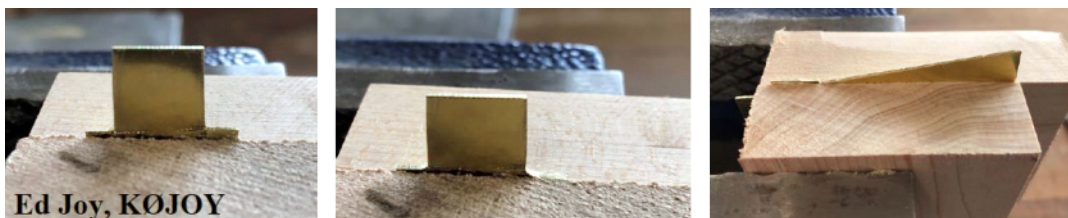
Note that the original dipole elements were actually extensions of the coax outer shield braid which was flattened and then bent at right angles to the coax. The center conductor was soldered to one of the dipole elements. Ed then soldered brass tabs onto the braid to lower the resonant frequency. He made these brass taps too long initially so he could latter trim them back to resonance at 23cm. Also note that he cut small slots in the plastic box to hold the brass tabs in place. The next photo shows more details on the brass tabs.



Fitting Dipole in Box and Attaching to Coax Choke Balun



**Above: Fabricating Broadband Dipole 0.025" Brass
Below: Filing Fixture Used to Achieve the Final Dipole Shape**



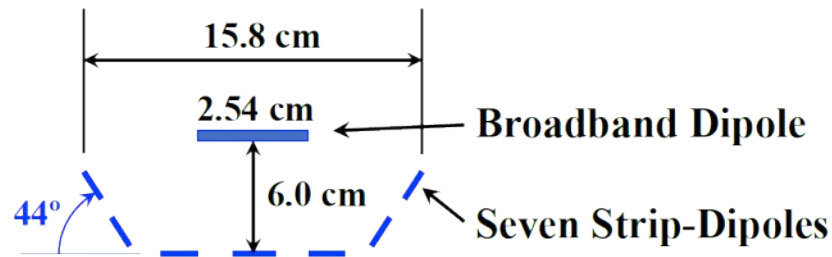
Feed Dipole and Seven-Dipole Feed Reflector Vertical Plane

Next Ed turned to computer antenna modeling to design the optimum reflector to use with his broadband dipole feed. He tried several different designs before deciding that a folded reflector using seven strip dipoles was optimum. The above plot shows the illumination pattern of the parabolic reflector.

Ed then fine tuned his antenna for lowest VSWR by trimming the dipole brass tabs back and also adjusting the spacing between the feed dipole and the 7 element feed reflector. The tuned dipole length which resulted was 11.3 cm. Ed used 3/8" dia. fiberglass rods as supports to hold the feed reflector in place.

Ed measured the VSWR with an Anritsu S361E Site Master. Resonance was at 1265 MHz with a VSWR of 1.05. The VSWR was less than 1.45 over the whole 23cm band from 1240 to 1300 MHz.

Top View



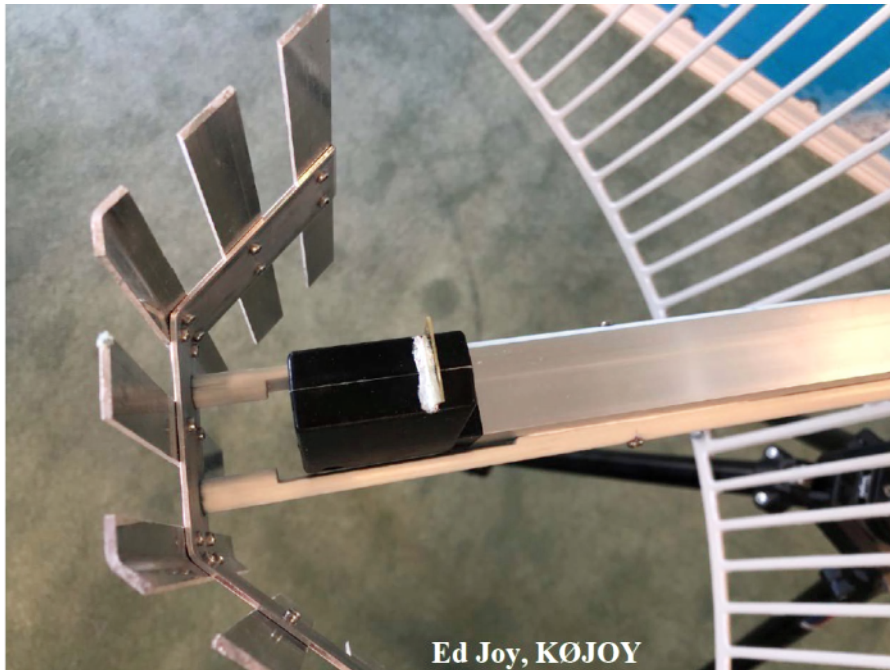
**11.3 cm Broadband Dipole with
Seven-Strip-Dipole Reflector**

VSUR < 2 (23 cm Band: 1240 - 1300 MHz)

Edge Illumination of Dish in Vertical Plane = -8.8 dB
Edge Illumination of Dish in Horizontal Plane = -8.9 dB

Ed Joy, KØJOY

Final Design - Feed Antenna with Feed Reflector



Ed Joy, KØJOY

**Broadband Dipole Feed Antenna with Seven-Element
Strip Dipole Reflector**

Ed then installed the new antenna on his roof top replacing his old Yagi antenna. He was able to compare the performance between the two antennas by keying up the Boulder ATV repeater, WØBTv, on 23cm and simultaneously watching the repeater's output on 70cm.

The repeater uses a Hi-Des HV-120, DVB-T receiver. The receiver's on screen display is permanently enabled and displays the rf input power (in dBm), signal to noise (in dB), frequency/bandwidth and call sign. The rf power meter has been found to be quite accurate and linear, but it does have a significant offset.

Thus Ed was directly able to measure relative differences accurately to within 1dB. Ed's new antenna gave him a whopping 11dB improvement over his old Yagi. Ed's computer modeling of the antenna predicted it would have a gain of 19.6 dBiL (L for linear polarization).



**Replaced 6-Element Yagi-Uda with 60cm x 100cm
Reflector. 1243MHz theoretical gain increase =
7.25dB, measured increase = 11dB**



Ed Joy, KØJOY

External links

If you have an eBook reader that does not have WiFi then you will not be able to use the hyper-links in this publication. If you have an eBook reader that has WiFi then you will be able to providing you are in a WiFi zone.

But if you have a Kindle 3G then yes, but only to Amazon, and there is not a lot of ATV material on their site. Smart phone reading apps are ok providing that you have a 3G data connection.

Note: These links will fire up your devices browser and if you are using 3G/4G then you will incur data usages charges.

Legal Niceties *(the small print)*

E&OE. Whilst every care is taken in the production of this publication, dotMOBI accepts no legal responsibility for the advice, data and opinions expressed. dotMOBI neither endorses nor is it responsible for the content of advertisements or the activities of those advertisers. No guarantee of accuracy is implied or given for the material herein. dotMOBI expressly disclaims all liability to any person in respect of anything and in respect of the consequences of anything done or omitted to be done wholly or partly in reliance upon the whole or any part of this publication. As the regulations for the operation of radio frequency equipment vary in different countries, readers are advised to check that building or operating any piece of equipment described in dotMOBI will not contravene the rules that apply in their own country.

All copyrights and trademarks mentioned in this publication are acknowledged and no infringement of the intellectual copyright of others is intended.

Copyright

The articles contained in this publication remain the copyright of their respective authors and NOT dotMOBI. Any reproduction of such articles must be approved by the author of that article.

Notice to Contributors

Authors are alone responsible for the content of their articles, including factual and legal accuracy, and opinions expressed by them may not reflect the editorial stance of the publication. Material submitted to dotMOBI should not infringe the copyright of other writers or bodies. Contributions are accepted for publication on this basis alone. dotMOBI publications - <https://cq-datv.mobi>

Author Guidelines

CQ-DATV welcomes contributions from our readers. It does not necessarily have to be on ATV, as long as it is of interest to our readers.

Although a formatted article showing the layout can be sent, we prefer an unformatted text file of the script, along with annotations of where important images should be placed. All images should be identified as Fig 1 etc and sent seperately.

Images should be in PNG format if possible and the best quality available. Do not resize or compress images, we will do all the rework necessary to publish them.

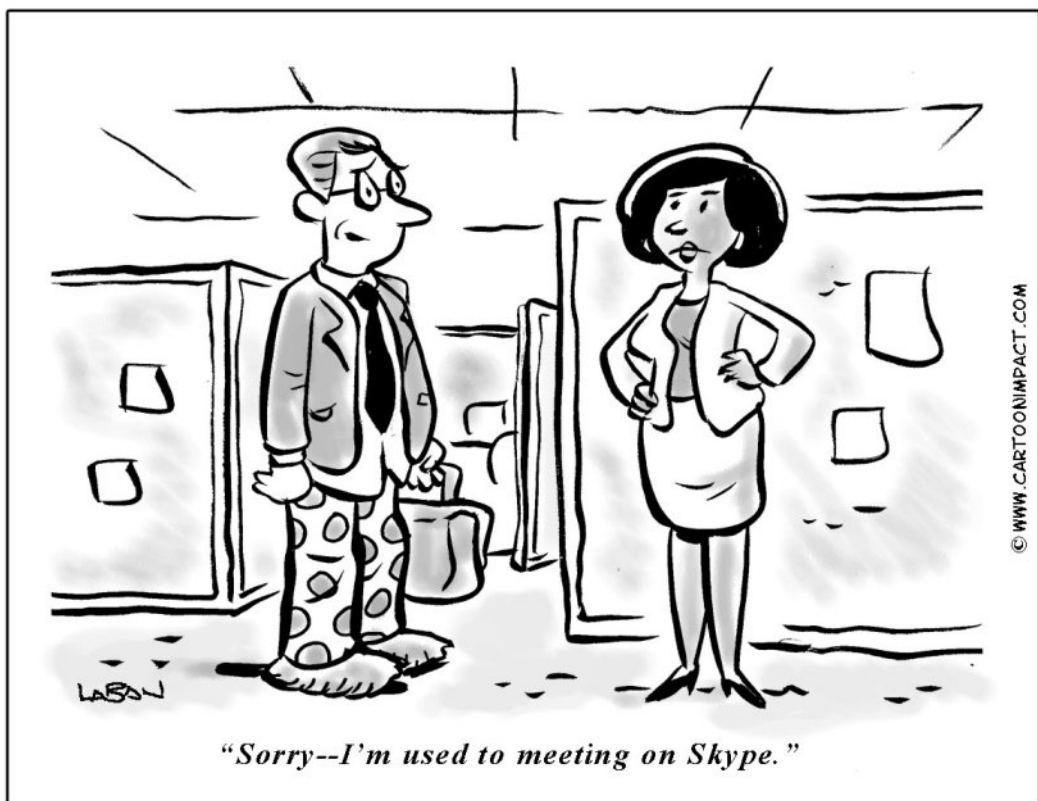
If you are sending a construction project, please include the dimensions of any pcb's and make the pcb image black and white, not greyscale.

CQ-DATV reserves the right to redraw any schematics and pcb layouts to meet our standards.

Coming up in CQ-DATV

Is this the latest issue of CQ-DATV? [Click here](#) to go to our web site to check to see if there is a later edition available.

CQ-DATV is published on the last day of the month. The cut-off day for submissions/corrections/alterations is 5 days before the day of publication.



Courtesy of Breakthrough Visuals



Please note that this mailing list is only used to advise interested people about the availability of new issues of CQ-DATV magazine. The list is not, and never will be, shared with any other organisations.

Want to be notified when issues of CQ-DATV are published? Join our [mailing list](#).